Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L12	56	carbon adj fiber and gate and cage	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2005/03/03 16:46

EAST Browser - L12: (56) carbon adj f... | US 5590225 A | Tag: S | Doc: 4/56 (SORTED) | Format : KWIC

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1	US 3943644 A		USPAT	19760316	24	US 3943
2	US 5190713 A		USPAT	19930302	5	US 5190
3	US 5256718 A		USPAT	19931026	24	US 5256
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14	US 5826554 A		USPAT	19981027	16	US 5826
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19	US 6300695 B1		USPAT	20011009	26	US 6300
20	US 20010045762 A1		US-PGP	20011129	17	US 2001
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22	US 6362554 B1		USPAT	20020326	26	US 6362
23	US 6380294 B1		USPAT	20020430	30	US 6380
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42	US 20040022718 A1		US-PGP	20040205		
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US-PAT-NO: 5590225

DOCUMENT-IDENTIFIER: US 5590225 A

TITLE: Plastic holder for bearing

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Brief Summary Text - BSTX (7):

Plastic holders have heretofore been prepared with so-called engineering plastic material such as polyamide (nylon), polyacetal, polybutylene terephthalate, fluorinated resins etc. singly or in the form of a composite material reinforced with short fibers such as glass fibers or carbon fibers. Among these materials, the polyamide resin has been widely employed for the plastic holders because of satisfactory balance of the material cost and the performance, and excellent characteristics have been confirmed under medium work conditions. However, this material shows deterioration over a long period and cannot meet the market requirements under a condition of continuous use at a temperature exceeding 120.degree. C., or under a condition of continuous or intermittent contact with oils added with extreme pressure agents, oils or chemicals such as acids.

Detailed Description Text - DETX (7):

After testing, the flange portion of the smaller diameter was removed from the holder, mounted on a push-pull stand (SVH-12) manufactured by Imada Mfg. Co., ltd. in such a manner that the cage portion was placed horizontally, and was subjected to an annular tensile test with a tensile speed of 10 mm/min. to determine the breaking load and the breaking elongation (with respect to the internal diameter). Also, the rate of weight change of the holder was measured after the deterioration test. An assembly test was also conducted in order to evaluate the suitability of the holder for roller assembly operations. This test was carried out with an air-driven automatic roller assembling apparatus manufactured by Nippon Seiko Kabushiki Kaisha. FIGS. 17 to 19C illustrate the basics of the annular tensile test. The specimen used in the test is prepared from the upper annular portion of the holder. As shown in FIG. 17, a holder for a conical roller bearing is cut horizontally at the position indicated by an arrow, and the upper annular portion 170 alone is used for the test. Or, as shown in FIG. 18, a holder for a cylindrical roller bearing is cut horizontally at the position indicated by an arrow, and the upper annular portion 180 alone is likewise used in the test. The test specimen is cut out from the holder after the preparation thereof, because the strength of test specimen is strongly influenced by the flow of molten resin at the molding, so that a test specimen prepared from a production mold for the holders is most appropriate for use in the comparative strength test of the holders.

Other Reference Publication - OREF (1):

"Materials for plastics cages in rolling bearings", Ball Bearing Journal vol. 227, pp. 14-19.

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10	US 5741878 A		USPAT	19980421	41	US 5741
11	US 5750628 A		USPAT	19980512	42	US 5750
12	US 5767218 A		USPAT	19980616	41	US 5767
13	US 5807954 A		USPAT	19980915	41	US 5807
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16	US 6012648 A		USPAT	20000111	11	US 6012
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19	US 6300695 B1		USPAT	20011009	26	US 6300
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37	US 20030113940 A1		US-PGP	20030619		
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39	US 6617721 B1		USPAT	20030909		
40	US 20030183553 A1		US-PGP	20031002		
41	US 6673075 B2		USPAT	20040106		
42	US 20040022718 A1		US-PGP	20040205		
43	US 20040034430 A1		US-PGP	20040219		

corner fitting allows bulk cargo containers 100 of the present invention to be stacked with other types of ISO compliant containers of the same size for shipping, storage, or the like and to be manipulated using ISO compliant hoist apparatus.

Detailed Description Text - DETX (22):

In accordance with one aspect of the present invention, the interface 180 between the vessel 102 and supporting frame assembly 120 of the of the present invention allows loads to be uniformly distributed in the FRP material of the thin shell 104 across substantially the entire cross-section of the support member 108 thereby eliminating localized stress build-up and possible failure of the FRP material. As shown in FIGS. 8A, 8B, 9A and 9B, the support member 108 is comprised of a portion of the thin shell 104 formed so as to have an inverted, generally U-shaped cross-section 182 including U-shaped upper and lower surfaces 184 & 186. Similarly, the support member attachment 130 has an inverted, generally curved or U-shaped upper surface 188 complimentary to the shape of the support member 108. As shown, the support member attachment 130 may have a radius slightly smaller than the radius of the lower surface 186 of support member 108. This feature allows the FRP material of the support member 108 to be molded over the support member attachment 130 so that the support member 108 rests on the support member attachment 130. In an exemplary embodiment, the support member attachment 130 is comprised of a semi-circular channel formed of a metal such as steel, aluminum, or the like welded to the upper horizontal structural members 122 of cage 124. Alternatively, the support member attachment 130 may be made of non-metallic materials such as plastic, composites, or the like attached to upper horizontal structural member 122 of cage 124.

Detailed Description Text - DETX (31):

The discharge opening 116 is encircled by a tension ring 220 comprised of a continuous bundle of fibers molded within the FRP material of the thin shell 104 adjacent to the opening's rim 222. The tension ring 220 ties the longitudinally and transversely oriented sheets of fiber material of the thin shell 104 in position at the opening's perimeter and distributes tensile loads in the FRP material near the rim 222 to prevent excessive deformation of the discharge opening 116 under load. In this manner, the need for supporting structure, such as a metal frame or the like, to carry loads at the opening is eliminated. In exemplary embodiments of the invention, the tension ring 220 may be formed of a plurality of glass or carbon fibers bundled and embedded in the FRP material during fabrication of the hopper 110.

Detailed Description Text - DETX (32):

The discharge opening 116 is surrounded externally by an integrally molded, rectangular reinforcing frame 230 further strengthening the thin shell 104 adjacent to the discharge opening 116 and providing a surface to which mounting brackets 232 may be attached for mounting discharge apparatus 234 such as a slide gate 236, a conveyor 238, an auger 240, or the like. The reinforcing frame 230 is comprised of a core 242 formed of a structural foam material such a polyurethane positioned against the side walls 170 of the hopper 110 and imbedded in FRP material. As shown in FIGS. 11A, 11B, 12A, 12B, each perimeter side of the core 242 may have a generally triangular cross-sectional shape filling a large part of the area between the sloped outer surface of the hopper side walls 170 and vertical and horizontal surfaces 244 & 246 extending from the side walls 170 at the bottom of the hopper 110 and giving the reinforcing frame 230 its rectangular shape.

Detailed Description Text - DETX (34):

A slide gate 236 may be mounted to the reinforcing frame 230 so that discharge opening 116 may be selectively opened and closed. As shown in FIGS. 11A and 11B, the mounting brackets 232 may be generally angular in shape having an upper vertical portion 262 and a lower horizontal portion 264 forming a slide gate frame 266. The upper vertical portion 262 provides attachment to the reinforcing frame 230 via the discharge assembly supports 248. The lower horizontal portion 264 includes an upper surface 268 upon which the slide gate door 270 slides. A friction reducing material 272, for example Teflon.RTM. (a

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41	US 6673075 B2		USPAT	20040106	13	US 6673
42	US 20040022718 A1		US-PGP	20040205	17	US 2004
43	US 20040034430 A1		US-PGP	20040219	8	US 2004

US-PAT-NO: 6572619

DOCUMENT-IDENTIFIER: US 6572619 B2

TITLE: Cage plate for spinal fusion and method of operation

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Abstract Text - ABTX (1):
A cage plate for spinal fusion includes a cage made of a biologically inert material such as titanium, the cage being sufficiently porous to facilitate bony ingrowth and spinal fusion, and a plate to which the cage is attached, the plate being made of a biologically inert material such as titanium. In the preferred embodiment, the plate is generally rectangular and has a longitudinal axis that in use is disposed parallel with the longitudinal axis of the spinal column, the plate being curved when viewed from the end, the curvature approximating that of the vertebral bodies to be fused, and the plate being curved when viewed from the side, the curvature approximating that of the vertebral bodies to be fused. The plate includes a plurality of openings adjacent its corners. In use, an opening is formed in the spinal column of approximately the same size and shape as the cage. The cage is inserted into the opening. In addition, several small openings are formed in the vertebral bodies. Bone screws are inserted through the openings in the plate and into the small openings in the vertebral bodies. The plate and the cage thus are secured to the vertebral bodies and the vertebral bodies are immobilized.

TITLE - TI (1):
Cage plate for spinal fusion and method of operation

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28326 Gates Mill Blvd.

Inventor Group - INGP (1):
Santilli; Albert N. 28326 Gates Mill Blvd. Pepper Pike OH 44124

Brief Summary Text - BSTX (3):
The invention relates to spinal fusion and, more particularly, to the fusion of vertebral bodies through the use of a cage plate.

Brief Summary Text - BSTX (7):
The use of non-biological implants, such as carbon fiber spacers, also has been attempted in the past, but these spacers tend to lack sufficient porosity and tissue ingrowth characteristics to function adequately. However, the spacer disclosed in U.S. Pat. No. 5,961,554 is made of sintered titanium beads which provide excellent porosity and strength.

Brief Summary Text - BSTX (11):
In response to the foregoing concerns, the present invention provides a porous intervertebral spacer, or cage, that can be used in the same manner as a bone graft spacer to fuse vertebrae together. The present invention also includes a plate to which the cage is attached. The plate is connected to the vertebral bodies that are being fused together, preferably by the use of bone screws. In combination, the cage and the plate provide superior fusion capability and strength, ease of installation, and bony ingrowth characteristics.

Brief Summary Text - BSTX (12):
The cage according to the invention can be made of a variety of substances that are inert to the body and which will not be rejected by the body. Sintered titanium or titanium alloy beads or wire mesh of titanium or titanium alloys as disclosed in U.S. Pat. No. 5,961,554 are the preferred materials for the cage. Another possibility is pellets of PEEK (polyaryl, ether, ether ketone) polymer or other strong polymers sintered in a mold of a desired shape

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	Document ID	Kind Code	Source	Issue Date	Pages	Image D
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(12) **United States Patent**
Santilli

(10) **Patent No.: US 6,673,075 B2**
(45) **Date of Patent: Jan. 6, 2004**

(54) **POROUS INTERVERTEBRAL SPACER**

(76) Inventor: Albert N. Santilli, 25326 Gates Mills Blvd., Pepper Pike, OH (US) 44124

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 60 days.

(21) Appl. No.: 10/004,916

(22) Filed: Dec. 3, 2001

(65) **Prior Publication Data**

US 2002/0120335 A1 Aug. 29, 2002

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/592,694, filed on Feb. 23, 2001.

(51) Int. Cl.[7] A61B 17/56
(52) U.S. Cl. 606/61; 623/17.16; 623/23.51
(58) Field of Search 606/51, 70, 69, 606/72, 71, 60; 623/17.16, 17.11, 11.11, 23.56, 16.11, 23.51

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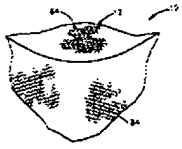
Primary Examiner—Pedro Philogene
(74) *Attorney, Agent, or Firm*—Rankin, Hill, Porter & Clark LLP

(57) **ABSTRACT**

An intervertebral spacer suitable for use as a spinal implant includes a rigid, porous body made of a biocompatible material. The body is strong enough to accommodate loads imposed by adjacent vertebrae and is porous enough to facilitate tissue ingrowth and bony fusion. The porosity is provided by a plurality of randomly sized, substantially interconnected voids dispersed throughout the body. The spacer can be manufactured by a variety of techniques. In one technique, a plurality of polymer pellets are placed in a mold of a desired shape and heated to melting or near-melting temperature. The pellets are fused together to form a porous, rigid structure. In another technique, tortuous strands of a biologically inert material are intermixed with each other and are sintered into a desired shape in a mold. The spacer also can be made of a sintered mixture of strands and pellets of a biologically inert material. The material for the strands and the pellets typically is titanium or a titanium alloy, although other metals and certain polymers such as PEEK can be used. In another techniques, the spacer is made of void-containing foam metal, void-containing powdered metal, or void-containing ceramic. The spacer also can be made from a solid block of a biocompatible material by drilling or machining a plurality of interconnected openings that extend through the block. The spacer can be provided in a variety of shapes to suit the needs of individual patients.

27 Claims, 4 Drawing Sheets



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	Document ID	Kind Code	Source	Issue Date	Pages	Image D
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(54) **ANATOMIC VERTEBRAL CAGE**

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(57) **ABSTRACT**

A spinal fusion system includes a cage with a fillable volume and removable locking gate, thereby enabling the fillable volume to be packed with graft, biologic or other materials prior to the gate being closed and locked. In the preferred embodiment, the locking gate is positioned anteriorally, though lateral, posterior, and combinations thereof are also possible. The cage is preferably radiolucent, being composed of a carbon fiber, but with one or more radiopaque markers to provide a certain degree of visualization. Some or all of the walls of the cage may include superior and/or inferior surface features to enhance positioning and/or minimize back-out, and the posterior wall may be indented to prevent neurocompression. The sidewalls of the cage may further include a recessed face with nipple indents and locking fasteners. According to a system aspect of the invention, multiple cages are provided, each being shaped differently for use at different spinal levels. For example, the cage may be larger and more trapezoidally-pronounced for the L5-S1 levels, or smaller and less trapezoidally pronounced for the T and L2 levels. The system may further including an implant introducer instrument geometrically matched to the cage, and the matched implant introducer instruments and cages may be color-coded to expedite the procedure.